



TOMATO CULTURE

Tomatoes should be ripened early to secure a large yield.

Plants should be eight to ten weeks old before being set out in the open. In the warmer parts of Ontario the seed is sown in the greenhouse mostly during February, and in the colder sections in March and early April.

Soil for Seed Bed

A friable, fairly rich soil, well drained is essential. Sods from turf, sandy loam with a six inch layer of well rotted manure between each two layers, will, after standing in a pile for one year, make a good soil. The sods should be lapped in the pile so as to avoid open spaces. When using, the pile should be cut with a sharp spade from top to bottom in thin slices. The surface of a field where manure has previously been applied, and no tomatoes grown the previous season, will also supply good soil. Drainage may be improved by adding to the soil a little clean, coarse river sand.

Seed and Seeding

Good seed of a suitable variety is necessary and most economical. Some growers mark their best plants and later save the seed by selection.

Early varieties recommended include Alacrity, Earliana, Heral, Canadian, Abel, Bison, and Penn State. The two latter are not suitable for staking. Bestal and Harkness, of recent origin, produce smooth fruit of high quality. Bonnie Best, John Baer, Marglobe, Pritchard, Scarlet Dawn and Break O'Day are good mid-season varieties. Globonnie is a mild tomato bearing fruit, medium in size and excellent in quality.

The seed should be thinly broadcast or drilled, in flats or boxes, eleven by twenty-four inches, containing four inches of soil. The bottoms should have six one-half inch holes for drainage. Heavy screen wire, five meshes to the inch, may be used for bottoms. The seed when sown should be covered with one-quarter inch of soil and the flats placed in greenhouse or hot-beds. The seed may also be sown directly in the bed or started in pots in the house. When the seed is sown into the hot-bed it should be sown in rows one-quarter to one-half inch deep, four inches apart and moderately thick. Cover with sifted sand or preferably sandy loam and press firmly. An ounce of seed will produce two thousand plants. Three ounces will produce enough good plants for one acre planted four by four or five by five feet apart.

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Care of Plants

Water the soil regularly but not excessively. Crowding produces spindly plants.

When plants have developed the first pair of rough leaves above the seed leaves, prick out into flats or hot-bed two by two inches apart. Transplant again as soon as they begin to crowd, four by four inches apart and a final transplanting six by six inches apart or in six inch pots.

When the crop is to be for canning, plants are grown six by six inches apart in a hot-bed or cold frame and, a week before planting out, a square of soil is cut by a sharp spade around each plant, and the plants removed by fork or spade at planting time.

Hardening off the Plants

Expose the plants gradually to outside conditions from a week to ten days before planting out. Gradually increase the air in the frame until the sashes are completely removed and left off entirely. The plants should then be able to resist cool night temperatures when planted out.

Soil Requirements

Tomatoes respond to a quick warm soil. Availability of plant food is important. A limited amount of nitrogen early in the season will develop healthy wood but nitrogen in excessive amounts or if available throughout the season produces a soft growth. Phosphoric acid and potash develop and ripen the fruit, therefore a well-balanced condition of the soil is necessary.

Tomatoes do well following a hoed crop for which the land was well manured. Tomatoes may be grown following a clover sod.

Growers are advised to follow the recommendations of the Advisory Fertilizer Board for their Province. For Ontario the following recommendations have been made: use a 2-12-10 at 500 to 1,000 pounds per acre, on light or sandy loam soil, or a 2-12-6 at 500 to 1,000 pounds per acre on clay loam soils. If clover has not been grown or manure applied previous to the tomato crop, increase rate of application and supplement with a 200 pound per acre side dressing of nitrate of soda or sulphate of ammonia one week or ten days after planting.

Time to Plant

Since the tomato plant is tender, it is not set out until danger of late frost is past, as a rule, until after the middle of May to the tenth of June.

Distance of Planting

For field culture, the plants should be set four to five feet apart each way. If planted four by four feet apart 2,722 plants will be required per acre. With the early maturing varieties, the distance apart in the rows may be reduced. For staked tomatoes, the rows should be four feet apart, with plants one-and-a-half to two feet apart in the row. When the plants are set one-and-a-half feet by four feet apart 7,260 plants will be required per acre, or if set at two by four feet apart 5,445 plants per acre.

Planting

When removing plants from hot-bed or cold frame to the field, disturb the root system as little as possible. Plants carefully handled will become established and grow more quickly than plants that have been carelessly handled. Early maturing depends to a large measure upon care at planting time. Pot or strawberry box grown plants check less than those lifted directly from a hot-bed or cold frame. For legy plants, a short trench should be made at one side to allow the plants to be laid down, and the roots and stem covered with soil, leaving about nine inches of the top growth exposed. The plants will not then be

damaged by wind. In regions of late frosts it is a desirable way to handle the plants. Should the tops be severely frozen, by uncovering a portion of the covered stem, new growth will rapidly form a new top. Where the stem of a tomato plant has been covered with soil, new roots develop along the entire length. Mounding with soil gives support against heavy wind, and frost. By setting the plants in a sloping position in the direction of the wind, loss may be avoided.

Staking

Training the plants to one or two stems on stakes has been found advantageous. Stakes five feet long and about one and one-half inches square are satisfactory. Deformed steel rods if used should be six feet long and three-eights of an inch in diameter. A trellis may be constructed, wires spaced nine to twelve inches apart. As soon as the plants are set out, one or two stems should be tied with soft twine or raffia to the stakes or wires, and all lateral growth or branches developing from the axils of the leaves pinched out. This produces symmetrical, clean fruit, and where nights are cool in summer, the tomatoes ripen sooner than where plants grow on the ground. In the higher altitudes in British Columbia, plants are set out in rows two-and-one-half feet apart, and one foot apart in the row. Tied to stakes the plants are allowed to set from two to three trusses of fruit, after which, all new growth is kept removed.

In sections where it is difficult to get a quantity of ripened fruit, fruits that have developed colour can be pulled and ripened in the house, or the plants may be pulled and hung up indoors in a dark moderately warm room.

Cultivation

Soon after planting, the cultivator should be started, to maintain a mulch and control weeds. Plants carefully set in squares allow use of the horse cultivator in both directions, and reduces the amount of hand hoeing. Deep cultivation may be given at first, but as the season advances, cultivation should become shallower and be confined to the centre of the rows. When hoeing, bring a little soil up to the stems of the plants to give support.

Common Insects Attacking the Tomato

Cutworms.—Tomato plants are frequently attacked by cutworms. They feed at night and lie hidden during the day near the base of the stems. They may be easily controlled through poisoned bran bait, composed of 20 pounds of bran, $\frac{1}{2}$ pound of Paris green, one quart of molasses and $2\frac{1}{2}$ gallons of water. This bait should be of the consistency of wet sawdust, and broadcast over infested fields in the late evening of a warm day at the rate of 20-25 pounds per acre.

Hornworms.—Large green caterpillars when abundant, strip most of the foliage from a plant and attack the forming fruit. The caterpillars appear in mid-July and grow very rapidly over a period of a month to six weeks. Spray with arsenate of lead at the rate of $2-2\frac{1}{2}$ pounds to 40 gallons of water. Spraying must be commenced when the caterpillars are small, when usually one application of spray is sufficient, provided it is applied early in the season. If spraying is delayed, hand-picking of the insects will have to be resorted to, since the late use of arsenicals endanger the consumer.

Garden Slugs.—Ripening fruit lying on the ground is sometimes attacked by slugs. A bait composed of metaldehyde and bran has given results; it can be secured at most seed houses. It would probably be too expensive for large fields. Directions are printed on the container.

Crickets.—Crickets, like garden slugs, frequently attack tomatoes and chew holes in the soft flesh. Scatter poisoned bran bait, as for cutworms, in places where feeding is noticed. To control crickets, however, the bait should be spread in the morning of a warm day. Do not scatter bait on ripening fruit.

Flea Beetles.—In some years the foliage of young tomato plants is attacked by flea beetles, which eat tiny holes in the leaves. Where they are abundant, the plants should be sprayed with 4-4-40 Bordeaux mixture. Special attention should be given to the lower surface of the leaves where feeding takes place. This spray should be repeated at intervals of ten days as long as injury is noticeable.

Diseases Affecting the Tomato Crop

Outdoor-grown tomatoes are subject to a number of common diseases. If the directions recommended in the preceding sections of this circular are followed, no serious loss from disease should occur unless very exceptional conditions prevail. There are, however, certain infectious diseases which require special treatment.

Seed Treatment.—Freedom from seed-borne diseases may best be secured by growing one's own seed. A few plants should be isolated from the main crop, and seed selected from those showing superiority of type and freedom from disease.

When seed of unknown origin is used, risks may be avoided by seed treatment. Dissolve one mercuric chloride tablet in 48 ounces of water, and soak the seed for 5 minutes. If some of the newer organic mercury disinfectants are used, follow closely the directions issued with each package.

Soil Sterilization.—Treatment of seed is of little use if this seed is sown in soil that is carrying disease germs. Soil for seed beds or flats should be steamed, or should be disinfected by mixing in some granulated charcoal sprinkled with formalin. Either of these treatments will assist in preventing seedling diseases and "damping off" troubles, but cultural directions regarding soil, spacing of plants, watering, temperatures, and hardening off must be followed carefully to produce robust plants resistant to disease.

Spraying the Growing Crop.—As soon as the plants have become established, spray with a 4-4-40 Bordeaux mixture, and repeat this spray every two weeks. One spray, properly put on, is better than a dozen carelessly applied. Consistent spraying with Bordeaux mixture will prevent the spread of fungus and bacterial diseases which may attack the above-ground parts of the growing crop.

Roguing for Virus Diseases.—Virus diseases cannot be controlled by spraying, although the spread of virus diseases may be checked by spraying to keep down the insects which act as carriers of the virus from one plant to another.

Virus infected plants should be rogued out as soon as they can be distinguished. Go over the field frequently and remove all suspicious, mottled, stunted, "bunch topped," or leaf spotted plants. Carry them off in a basket and burn them. Do not throw them on the manure pile, as viruses may live for years. Do not rogue the plants when wet, and do not touch clean plants after pulling diseased ones. Refrain from using tobacco in any form when working with tomato plants. Do not grow solanaceous crops (potatoes, tomatoes, peppers, eggplants, etc.) in too rapid succession and provide for long rotations.

Blossom-end Rot.—This disorder appears as small water-soaked dark green spots at or near the blossom end of the tomato. The affected tissues later collapse and become leathery and brown in colour. This is caused by excessive watering or prolonged rain followed by hot, dry weather. The disorder may be prevented if a slow but steady growth rate is maintained. Over fertilizing with nitrogenous fertilizers invites this disorder.

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